NISTTech

VAPOR PHASE METAL-ASSISTED CHEMICAL ETCHING

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Abstract

This invention details a new method to fabricate complex and definable 1D, 2D and 3D nano- to micron-sized structures in silicon using a catalyst, such as Ag, Au, Pt, Pd, and others, and a vapor containing Hydrofluoric Acid (HF) and an oxidizing agent, such as Hydrogen Peroxide (H2O2). A metal catalyst is deposited or patterned on the silicon surface and then exposed to HF and H2O2, vapor, by varying the HF and H2O2 partial pressure (concentration), catalyst material, catalyst shape, substrate temperature, and pressure. The etch rate, feature resolution, and etch path of the catalyst can be controlled to fabricate 1D, 2D, and 3D structures with aspect ratios greater than 500:1 with feature resolutions on the order of 1-2 nm.

References

- Pub. US 2015/0147885

Status of Availability

This invention is available for licensing exclusively or non-exclusively in any field of use.

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